



RF



ORANGE COUNTY AMATEUR RADIO CLUB

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### THE DX COLUMN --by Bob, WB6QNU

This month let's discuss the different ways to send your QSL's to DX stations. The percentage of returns you receive depends in part on how you send them. If you are QSL'ing a common DX station use one of the less expensive methods, but if you've just worked that AC5 or whatever, that you have been after for years then go all out and chances are his card will be gracing you're walls soon. Let's look at some of the ways to send your cards off:

- 1) Via outgoing bureaus- A few hams, and organizations in the U.S. run outgoing QSL bureaus. They will forward your cards in groups along with cards from other hams to foreign QSL bureaus or direct if enough cards are received heading for one person. Some outgoing bureaus include an SAE with postage when sending directly to a foreign station and when the QSL's are sent back in reply the outgoing bureau forwards them to the ARRL bureaus. The cost is around 5¢ per card or \$1.00 per 25 cards. The bureau I use is W3KT though I'm sure there are others as good. The outgoing bureau is a way to QSL stations who request you do so thru the bureau, or return QSL the cards you received thru the ARRL bureau. Outgoing Bureaus can usually handle those cards you can't get QSL information on.
- 2) Via Foreign bureaus- If you have a lot of cards destined for one country, such as Japan or Australia, etc., or you have no address for a station except his country and don't want to go thru an outgoing bureau most countries have a QSL bureau similar to the ARRL bureau, for their hams. The list of these bureaus appears from time to time in QST and is also in the information given in the first few pages of the Callbook. Box 88 Moscow is the Russian QSL bureau and one of the few ways to get cards to Russia.
- 3) Via U.S. Managers- If the DX station has a stateside QSL manager it is only necessary to send him the QSL along with an SASE and your card will be on its way soon after he receives the DX station's logs covering your contact. Some managers will send your cards via the ARRL bureau if you forget to include an SASE and others will just put them in the circular file. When they are handling thousands of QSL's each year they can't be expected to give special treatment to everyone.
- 4) Via Foreign managers- If the DX station has a manager in a foreign country and you want the card to go as quickly as possible send to the foreign manager as you would the local manager except send an SAE and some type of return postage good in his country. (IRC's are the classic item sent but there are others that can be much cheaper for you and easier for the other station. This will be discussed further in next months column.) If no return postage is provided the card will probably come back thru the bureau if at all.

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DX COLUMN - cont.

4) Direct- QSL'ing a DX station direct is similar to sending to a foreign manager. If you want a direct reply enclose a SAE and return postage. If you wish the card to be returned via the ARRL bureau so state on the QSL near where it says: PSE QSL.

General: Here are some general hints for mailing your card:

- 1) In the USA use first class mail instead of airmail. Much of the first class mail between large cities over a few hundred miles apart goes via air anyway these days.
- 2) I've found airmail is the best way to send mail overseas. Mail to some countries can spend months in transit on ships when going surface mail. However remember some overseas airmail is not like the one day service in the US. Mail to some islands and out of the way places will go by air some of the way and boat the rest of the way. One good example is mail to VR6TC on Pitcairn Island which goes via air to South America and then via boat to the Island. The boat goes only once every few months.
- 3) When sending overseas via airmail remember the price is per half ounce so keep it light. The use of onion skin airmail envelopes helps a lot. A QSL and SAE will fit under the half ounce limit easily. Be sure to put those red AIRMAIL (PAR AVION) stickers on the front and back of both envelopes unless you are using the very conspicuous red and blue envelopes. Check the recent foreign airmail rates too. They just were reduced (Can you believe that). The Post Office has a brochure showing all the rates you can pick up next time you're there.
- 4) When sending IRC's or enclosures of similar value try to use the non see thru airmail envelopes or hide them between the QSL and a plain piece of opaque paper so they aren't easily noticed from the outside or you may end up buying someone a beer; Especially in some of the South American and African countries.

GUD DX FRM 'QNU

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THE PREZ SAYS:

This my first attempt at writing this column so let me take this time to give you a little of my history. I started as a ham back in '59 as WV2GUQ in Manhasset, N.Y. After my year as a Novice I got my General and had my call changed to a WA2. My early experiences with a rig was an NC-88 receiver and a DX-40 transmitter. While the transmitter worked fine I never could hear much on that NC-88. The DX-40 gave way to an Apache but my French teacher stopped any chance I had of getting a good receiver to go along. About that time I helped my high school start it's first radio club. High school ended without me getting any better ears than that NC-88 except for a two week period when I borrowed a Heath Mohawk receiver to see if I could fix it. I had it working in a few hours and loaded up on 20 meter

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### THE PREZ SAYS- cont.

CW for my first taste of real DX. The next two weeks were heaven for me with a DX record approaching 40 countries. Unfortunately the receiver had to be returned and I had to go off to college. My years at Penn State were void of ham radio because there was no club and I couldn't get time to see about starting one. In 1965 I came out to see sunny California and finished up school at Long Beach State, majoring in Physics. It was at this time I received my WB6 call I hold today. After finishing college I started working for the Douglas Aircraft Co. in Long Beach where I'm still working today most of my time spent there was on the DC-10 airliner testing.

Well that's a quick run down on me and my ham history. Perhaps some of the other board members would like to tell a little about themselves in the future issues of RF

Now down to business: We still need an editor for RF. Ken and I are putting out this issue and Ken put out the last alone. If we could find someone to spearhead the paper it would take a burden off us and free us for other jobs required for the radio club. If you can't be editor at least contribute articles to the paper. Just send them to Ken or me (or even better to our new editor) and they'll find their way into the RF. If your English is not the greatest don't worry, we'll look your article over and make corrections as required. Heck, my English isn't that good!

I'm sorry I missed the club Christmas Dinner, but I was back in Buffalo having a white time of it. Thank you all who came and had a good time and turned this event into its usual success. Also, congratulations to Jack Shaw, W6YWN on winning the 2 meter xceiver. Jack...umm I'll be over to borrow it soon.

I hope to be holding board meetings every other month or oftener as required, to get the club back on its feet. These meetings I hope to have soon enough before the RF is printed each month so the minutes can be published and you can get a chance to read them and add your comments at the club meeting. Unfortunately it didn't work out this month so the board meeting, to be held early this week will be published in next month's RF.

See you this Friday at the meeting.

73 'QNU

### PROSE WALKER'S FORECAST -

At the recent Santa Maria Convention, Prose Walker of the FCC discussed the fact that a distinct possibility exists in the next six or eight years for amateur radio to obtain additional frequencies so that we may have bands about every 3 mHz between 3 and 30 mHz. This is because many of the governmental and commercial communications services are switching to the more reliable satellite and improved cable communications systems, and large gaps are now appearing in the frequency spectrum. But we shall have to prepare very carefully for it. The ARRL started in November of last year to plan for this possibility and is now organizing a program that can present suitable arguments in a professional manner. This is what part of our "Long Range Planning" concept was all about when it was proposed a year ago, since enacted by the ARRL Board of Directors. What we have to plan for is a new ITU Frequency Allocations Conference on the HF bands, and therein lies both peril and opportunity. But I agree with Mr. Walker in that we should pursue a most aggressive attitude on this, and not be purely defensive.

### CALL SIGN CHANGES?? -

Those of you who heard Prose Walker speak at the Santa Maria Convention may recall that when he was asked about the possible changes in call signs, he indicated the idea had been a trial balloon. However, so that you may be completely informed, I call your attention to the fact that the Final Report and Order on the Repeater Docket states definitely that new repeater licenses will bear the prefix "WR" which is one of the call sign changes Mr. Walker had previously mentioned in talks at SAROC and Dayton. I believe the same document lays the groundwork for the prefix "WS" to be used for space and satellite stations. Now I have an unconfirmed report that the first regular WD6AAA call has been issued in California! This skips the "WC" prefix entirely, which leads naturally to conjecture that "WC" prefixes might be in process of being reserved for Conditional Class licenses. This would be in keeping with Mr. Walker's previously proposed changes in call signs.

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## NOISE WITH DIGITAL INTEGRATED CIRCUITS

by Ken, W6HHC

More and more ham projects are using digital circuits. They can be used for frequency counters, keyers, telephone dialing circuits, etc. To find or design a circuit to do the job is one thing, to make it work right is a completely different problem if you are fighting noise. The following article is a summary of the ideas and hints presented by the Texas Instruments' book "DESIGNING WITH TTL INTEGRATED CIRCUITS".

### TYPES OF NOISE

Several types of noise must be dealt with in a digital system.

- 1) EXTERNAL NOISE- circuit breakers, arcing relay contacts, RF
- 2) POWER LINE NOISE- coupled through AC or DC power distribution
- 3) CROSS-TALK- introduced by adjacent signals
- 4) SIGNAL CURRENT- self-induced by magnetic intercoupling
- 5) TRANSMISSION LINE REFLECTIONS- same problem as with rf (SWR)
- 6) CURRENT SPIKES- current surges caused by switching

### GROUNDING

Signals traveling more than two feet must go through either twisted-pair or coax. When grounds are poorly returned, signal currents and returning ground currents see the discontinuity as a high impedance and a noise spike is generated. Figure 1 shows how the ground current in a line driver (G2) produces a noise spike (N) because of poor ground return. This noise is picked by another gate (G1) and amplified by a third gate (G3) producing a false output. Figure 2 shows ideal grounding.

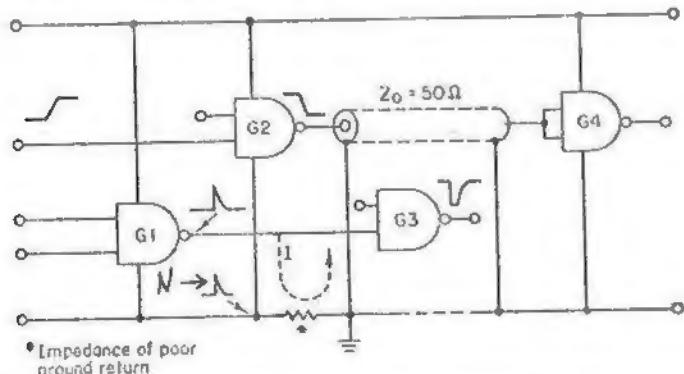


Fig. 1 - Noise generation due to poor transmission-line returns.

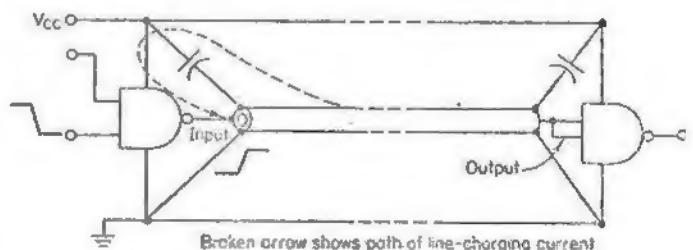


Fig. 2 - Ideal transmission-line current handling.

Three rules to reduce transmission line current effects are:

- 1) Carry twisted-pair and coaxial ground returns to a good ground termination close to BOTH the driving and receiving devices.
- 2) Decouple +V of the line-driving and line-receiving gates close to the device with a .05 or .1 MFD disk ceramic
- 3) Reserve all gates within a package being used for line driving or line-receiving solely for that purpose.

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## NOISE WITH DIGITAL IC'S -- continued

DECOPPLING

Whenever digital signals go from a "0" to "1", current has to be supplied by +V to charge stray capacitance. In addition, TTL devices (Transistor-Transistor-Logic) cause +V current spikes due to overlap of conduction in the output transistors again when the output is changing from low to high. Unless the power supply lines are properly filtered, these quick current surges can introduce noise to the circuits. The rules for proper filtering are:

- 1) Use one 10 - 50MFD capacitor for every 50 packages.
- 2) Use one .05 or .1MFD disk for every ten packages. These capacitors should be evenly distributed around the board.
- 3) Make the ground system as heavy as possible.

SUMMARY

The following rules have been established for the minimization of transmission-line effects in TTL systems:

1. Use direct wire interconnections that have no specific ground return for lengths up to about 10 in. only. A ground plane is always desirable.
2. Direct wire interconnections must be routed close to a ground plane if longer than 10 in. and should never be longer than 20 in.
3. When using coaxial or twisted-pair cables, design around approximately  $100 \Omega$  characteristic impedance. Coaxial cable of  $93 \Omega$  impedance (such as Microdot 293-3913) is recommended. For twisted pair, No. 26 or No. 28 wire with thin insulation twisted about 30 turns per foot works well. Higher impedances increase cross talk, and lower impedances are difficult to drive.
4. Ensure that transmission-line ground returns are carried through at both transmitting and receiving ends.
5. Connect reverse termination at driver output to prevent negative overshoot.
6. Decouple line-driving and line-receiving gates as close to the package  $V_{ce}$  and ground pins as practical, with a  $0.1-\mu F$  capacitor.
7. Gates used as line drivers should be used for that purpose only. Gate inputs connected directly to a line-driving output could receive erroneous inputs due to line reflections, long delay times introduced, or excessive loading on the driving gate.
8. Gates used as line receivers should have all inputs tied together to the line. Other logic inputs to the receiving gate should be avoided, and a single gate should be used as the termination of a line.
9. Flip-flops are generally unsatisfactory line drivers because of the possibility of collector commutation from reflected signals.

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"RF"

ORANGE COUNTY AMATEUR RADIO CLUB

JAN.

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OCARC ACTIVITIES

MEETING	3rd Friday each month, 7:30 p.m. AT the Mercury Savings and Loan, 1095 Irvine (4th) Blvd. in Tustin. Guests welcome.
BREAKFAST	1st Saturday each month, 8:30 am at Manuys Restaurant, 17th Street near Newport Freeway, Santa Ana. Meets in back of room.
15 M NET	Club Station W6ZE, meets every Thursday at 21.375 ( <u>±</u> QRM) MHz. at 8:00 p.m. All amateurs welcome to check in. Club and ARRL Bulletins read.

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DATED MATERIAL !!!